

Southern Blight

There are many diseases of vegetables that are extremely difficult to control and southern blight is certainly in that category. The reasons for that include the fact that it is a soil borne pathogen so getting effective fungicide products into the soil can be difficult. The other reason is that this fungus, *Sclerotium rolfsii*, has a host range of over 500 plants species that it can infect including field, vegetable, fruit, ornamental crops, trees and turf. Southern blight has been an especially troublesome disease for processing tomatoes, garlic and potatoes for the past several years here in the Southern San Joaquin Valley.

Southern Blight is a disease that becomes an issue every summer. It can occur essentially on all vegetable crops grown in the summer months. The disease is called summer blight because it is primarily found in the warmer parts of the US. In other parts of the country it may be referred to as Southern stem blight or white mold. Sometimes the disease is simply just called “rolfsii”.

It survives in the soil as small hard bodies of fungal tissue call sclerotia that resemble alfalfa seed. The sclerotia will germinate under warm moist conditions when a host plant is nearby. The fungus will primarily attack a plant at the soil line which makes its identification fairly easy. There a tan mass of fungal growth can be seen with a mass of alfalfa seed sized sclerotia (figure 2). The sclerotia will be initially white in color but become brown as they mature. The sclerotia, when found, will be extremely numerous (figure 2).

As the infection progresses plants will wilt and eventually die (figure 3). But inspection of the infected plants will show fungal growth mainly on the stems at the soil line, but also can be seen on any plant matter in contact with the soil such as tomato fruit on the soil surface or potato tubers. Often numerous sclerotia will be also on the infected plant tissue but sometimes that does not occur.

Southern blight is a problem during warm and wet conditions. The pathogen survives as mycelium on dead organic material when a host plant is not present. It also survives as sclerotia in soil. Sclerotia near the soil surface are active while sclerotia below 6 inches of the soil surface will become colonized and killed by various biological agents native to the soil. Studies have shown that southern blight infection is enhanced when there is plenty of organic matter in the soil.

Southern blight often goes unnoticed until it is wide spread in a field and the damage becomes easily seen. Initially the infections are restricted to small spots in a field. Once the sclerotia become more numerous in a field then disease becomes noticeable. Each infected plant can literally produce tens of thousands of sclerotia and then become more widely distributed in a field with each field operation. Within a season or two, southern blight can be serious enough to cause significant yield loss. It can progress very rapidly under warm and moist soil conditions of 86⁰F and greater.

Control of Southern blight is very difficult but there are some control options to help manage this pathogen. Scouting and mapping infested locations in fields during the summer months will greatly help in determining what options can be taken before the sclerotia levels become too numerous and cause severe crop loss.

Deep plowing will bury the sclerotia and get it away from attacking plants at the soil line. Sclerotia deeper than 6 inches are usually parasitized by other microbes and are killed over time. Of course fields on drip irrigation systems would eliminate this option. Crop rotations are limited because of the wide host range but non-host crops such as corn, sorghum and small grains will help to significantly reduce sclerotia levels in the field.

Fungicides such as flutolanil, penthiopyrad, tebuconazole and PCNB are known to be effective in the management of southern blight. However these products are registered on only a few vegetables so make sure to check crop registration before using these on any vegetable crop. Also some of these fungicides have severe plant-back restrictions so crop rotations need to be carefully planned. As always, make sure to read and follow label directions to avoid any problems. But perhaps the biggest obstacle to the use of any fungicide for the control of southern blight is application timing and method. Because southern blight is basically a summer time disease it rears its ugly head when most crops are near maturity with a full canopy cover. Getting fungicides to the base of the stem and onto the surface of the soil is very difficult especially for fields on drip irrigation systems. Chemigation through sprinklers is a better option especially on crops like garlic and onions which do not have a dense canopy. The one advantage of drip irrigation is that the soil surface can more easily be kept dry which inhibits infection by *Sclerotium rolfsii*.

But once sclerotia levels become too numerous in a field then fumigation will need to be considered. Metam sodium will control Southern blight but the costs of fumigation may limit its option in many situations. Also with the requirement of buffer zones means the field may become re-infested in short time as sclerotia are moved from the buffer zones into the rest of the field with various tractor operations.

Luckily Southern blight is not a widespread problem but in fields that do have it, it can be severe. Catching it early with scouting and mapping will allow early control options before it becomes a huge problem. Crop rotations are limited but there are some viable options for growers. Deep plowing, especially early before sclerotia levels become too numerous, can be very effective and cost effective. There are some fungicide options but issues with plant-back restrictions, amount of labeled crops and application techniques can limit the use of these products. The use of fumigation with metam sodium will need to be considered in fields severely infested.

Figure 1. Sclerotia of *Sclerotium rolfsii* on surface of tomato stem.



Figure 2. Mycelial mat of *Sclerotium rolfsii* growing on base of tomato stem.



Figure 3. Southern blight infested field.



Figure 4. Mycelial mat and sclerotia growing on carrot root.



Figure 5. Southern blight infection on garlic.



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